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COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS

U. S. Department of Agriculture
and State Agricultural Colleges
Cooperating.

Extension Service, Office of
Cooperative Extension Work
Washington, D. C.

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WEEDS

Excerpts from 1922 Annual Reports
of State and County
Extension Agents.

This circular is one of a series issued by
the Office of Cooperative Extension Work
as a part of its informational service to
State and county extension workers. The
material contained herein is not released
for printed publication.

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Division of Extension, Office of
Cooperative Extension Work,
Washington, D. C.

U. S. Department of Agriculture
National Agricultural College
Washington, D. C.

REPORT

Progress for 1932 Annual Report
of State and County
Extension Agents

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California

Experiments with carbon bisulphide on morning-glory.- The first test plots put out in 1919 killed the morning-glory so satisfactorily that the cooperator applied the treatment to the entire patch. The following year the field was farmed to beets. No morning-glory could be found and the beets in that spot appeared to be more vigorous. In 1920 two tests were made. In one test the cooperator used his own methods to kill the morning-glory. He put 1/2 pint of carbon bisulphide into holes 1 foot deep and 18 inches apart. At the end of one month the morning-glory was killed out. A root was followed down to a depth of 4 feet and was found to be dead below a point 6 inches from the surface. Curiously, there was an area from 4 to 8 inches below the surface where the root retained life. This plot was cultivated after being treated with carbon bisulphide and no more morning-glory appeared. The farm advisor prepared a test consisting of three plots. In the first the holes were punched 6 inches deep; in the second, 12 inches deep; and in the third, 18 inches deep. The holes were spaced at distances of 2, 4, 6 and 8 feet. The amounts of carbon bisulphide used per hole were 1, 2, 3, 4, and 5 ounces. The most satisfactory

*No attempt is made to cite all references to weeds in this circular. Only selected extracts showing typical methods employed and results secured in some States are included. Owing to differences in terminology used in the various States and to other local conditions, the information contained herein should be reviewed by the State subject-matter specialist concerned before incorporating any part of it in the extension plans for the State.

kill was made where the holes were 18 inches deep and 3 feet apart, with 4 ounces of carbon bisulphide per hole.

In 1921, following the results obtained the two previous years, the farm advisor put out three more test plots: the first with holes 18 inches apart, with 4 ounces of carbon bisulphide per hole; the second with holes 18 inches deep and 3 feet apart, with 4 ounces carbon bisulphide per hole; the third with carbon bisulphide poured in spots on the surface of the ground 18 inches apart each way. In the first and second the plants were killed satisfactorily, but a complete ^{kill} was not made where the carbon bisulphide was poured on the surface of the ground. In September, a demonstration meeting attended by 30 farmers was held on the plots. The results of the test were published. In the Spring of 1922 the land on which the plots were located was plowed and planted to Chevalier barley. As soon as the grain came up it could be seen that the plants in the treated plots grew ahead of those in the untreated. The former stood about 1 foot higher, until they finally lodged, while the untreated portion stood erect. Before being harvested the yields on both areas were estimated by means of a square containing 10 square feet. This estimate showed the yield on the treated plots to be 5,790 pounds per acre. As yet no morning-glory has appeared in the treated plots. This method of treatment with carbon bisulphide is recommended for small patches of morning-glory, which if left uncultivated would become large enough to cover several acres. If used in time it will prevent spreading. Where several acres are involved, however, we believe that constant cultivation is the cheaper remedy. - Thomas Mayhow, County Agent, Salina, Monterey County.

Idaho

County-wide weed-control districts.- Five counties in the State have established county-wide districts for the control and eradication of a number of weeds named in the weed order. The perennials and most persistent weeds are generally included. The Extension Service is required to furnish information on methods of eradication. Excellent results have been obtained by the enforcement of the weed law. It greatly facilitates the work of the department. Aside from assisting in furnishing information on methods of eradication, the department conducts an educational campaign on the eradication of weeds which are particularly detrimental to the production of high quality seed. The procedure is as follows: During the early part of the year meetings are held in the small-seed producing sections. At these meetings the importance of planting clean seed is stressed and general descriptions of the most noxious and inseparable weeds and weed seeds are given. Fifteen such meetings were held in the State during the months of February and March. Various methods of eradication were discussed. They involved spraying, flooding, clean cultivation and smothering. Later in the season when the weeds are distinguishable, excursions are held. Twenty-two were held during the months of May and June to acquaint those who attended with the noxious weeds and to create greater interest in the control work. The methods of spraying weeds were demonstrated on a majority of these excursions. Five counties carried weed projects this year. Idaho is apparently the first State to carry on an extensive campaign against dodder by the use of sodium arsenite spray. The use of this poison is still in the experimental stage but it has accomplished the desired results among small-seed producers. The work on the eradication of perennials by the spray method is showing promise. The sodium

arsenite used is prepared by the United States Smelting, Refining and Mining Co., Salt Lake City, Utah, and is called "Ussco weed-killer." Dilutions of 1 part Ussco to 50 parts water and 1 to 400 have been used. The more dilute solutions in most cases have proved most economical and effective. This work will be continued and more definite results obtained in another season. Dodder can be killed completely if the spray is applied in the early stages of growth, that is, before seed is set. Canada thistle has been destroyed in practically all cases after two, three, or four applications during the growing season. Morning-glory, the most persistent of all weeds in this State, has been killed to a depth of from 3 to 24 inches, with a consequent reduction of the vitality of the plant. - L. W. Fluharty, Director of Extension Service, Boise.

Weed-spraying demonstrations.- Demonstrations to show the effect of a poison spray of sodium arsenite on the control of morning-glory were conducted on 49 farms in 16 communities. Twenty-three such demonstrations were conducted in 12 communities on Canada thistle. Quack grass was sprayed in 8 demonstrations in 5 communities, while spurge and fan weed each was sprayed in one community. The spraying demonstrations were a continuation and expansion of those started in 1921. The spray material used was Ussco weed-killer. In each case the material was purchased by the farmer doing the work. The orders were pooled and sent through the county agent's office. Each cooperator before starting his work, was furnished a sheet of instructions and a data sheet by the county agent. Farmers spraying morning-glory used solutions with strengths of 1 to 150, 1 to 175, and 1 to 200. The results obtained last year showed that the best solutions for morning-glory would be found within this range. Those spraying Canada thistle used strengths of 1 to 75, 1 to 100, and 1 to 125 for the same reason. Quack grass was sprayed with solutions of 1 to 100, 1 to 125, 1 to 150, and 1 to 175. Spurge was sprayed with a solution of 1 to 100, and the same strength was used for fan weed.

Results of spraying demonstrations. - Results secured by the cooperators varied greatly. Some reported complete success in the control of Canada thistle and others complete failure. Although none had been entirely successful with morning-glory, many thought that the results justified continuance of the use of the spray. Others wanted to give up the trial. No satisfactory results were had from spraying quack grass. Fan weed was killed by one application, but spurge was controlled only partly.

(1) Morning-glory.- The cooperators who used the strengths of 1 to 175 and 1 to 200 in spraying morning-glory seem to have been more successful than those who used the stronger solution of 1 to 150. Results of the spray have been so indefinite that it cannot be recommended on the strength of present data. However, half of the farmers who used the spray want to continue it another season. They are satisfied that they are making as much progress in the control of the morning-glory as they would if they used clean-cultivation methods or any other method that has been tried in this county.

(2) Canada thistle. - L. A. Sheldon of Princeton, who was most successful with the spray in controlling Canada thistle, started the work in 1921 and continued into this season. He secured the best results with a strength of 1 part water to 100 parts Ussco weed-killer. He started spraying about the middle of June instead of waiting until the plants would be in full bloom about the middle of July. Mr. Sheldon is confident that if one starts spraying about the middle of June with a solution of 1 to 100 and keeps it up as long as new weeds are appearing, he will be able to eradicate Canada thistle in two seasons. Cooperators who did not secure such good results, report that the plants were greatly thinned and that those which came up were not nearly so strong as normally. Others report that the thistles came on as fast as before and apparently were as healthy.

(3) Quack grass. - The spray does not seem to be effective against quack grass or grass of any kind. Results here indicate that the best way to control quack grass is to dry-plow it fairly shallow the last of July or the first of August. We shall not continue spray tests on this weed.

(4) Spurge. - Spurge was sprayed on the only farm in the county where it was known to be growing. The spray burned the weed to the ground but seemed to do no permanent damage. However, we believe that too strong a solution was used on this weed as it is an especially tender plant. Different strengths of solutions will be tried at this place another year.

(5) Fan, French, or stink-weed. - Charles W. Smith, Smith-Hughes teacher of agriculture in the Genesee High School, cooperated with the town council in Genesee and with the county agent's office, in trying sodium arsenite for the control of fan weed. It was found that a solution of the strength of 1 to 100 killed all plants. However, the ground in the sprayed plots is so full of seed that mere spraying of the plants makes no real progress in the control of the weed. Therefore, it is recommended that alternate deep and shallow cultivation be practiced instead of spraying.

Conclusions. - Although the county agent is not ready to recommend the use of the spray unqualifiedly, he thinks that it may yet be found an effective means of controlling morning-glory and Canada thistle in this county. Results obtained so far appear to justify continued trials by farmers who have already done some work on these and other root-stock weeds that do not belong to the grass family.

Weed-control excursions. - Weed-control excursions were conducted in Harvard, Big Bear and Cedar Creek communities. R. L. Spangler, assistant State seed commissioner, was the chief speaker. All who attended were made familiar with the noxious weeds of their community and of the county as a whole. Only two or three farmers could identify all of the noxious weeds growing in their own community. Control methods were discussed and greater interest created. Mr. Spangler stressed the importance of buying clean seed tested by the Idaho State seed analyst in order to prevent weeds from starting.

Greater interest in weed control. - The Latah County Farm Bureau, at its annual meeting in Moscow on March 15, endorsed the efforts of the county commissioners to enforce the weed-control law and asked local project leaders to report cases of negligence. On April 19, the county commissioners appointed weed-control committeemen of the county farm bureau as reporters of cases of negligence so that landowners might be forced to clean up their weeds. The county agent prepared a news article on the

weed-control law and the attitude of the commissioners toward it. The article was published in all of the county papers. He also cooperated with Grant Robbins, chief of police of Moscow, and with the county commissioners in spraying sodium arsenite on morning-glory at public expense on a city lot. The commissioners have enforced weed-control work all over the county wherever necessary. Greater interest has been manifested in the work than heretofore. - C. S. Fletcher, County Agent, Moscow, Latah County.

Control of Canada thistle and fan weed.- The county commissioners named Lemhi County as a weed district for the eradication of Canada thistle and fan weed. Murray Crook, post control project leader, was appointed as weed commissioner. A survey was made of these weeds in the county and 10 demonstrations with the use of sodium arsenite were planned for the control of Canada thistle. Publicity in the form of circular letters and weed-control literature was to be sent at intervals to all farmers of the county in order to keep before them the importance of holding these weeds under control and not allowing them to spread. Nine demonstrations were held in the county. Twenty gallons of the concentrated sodium arsenite spray were used. Each farmer using the spray was pleased with the results for this year. The problem was to get the average man to use the spray solution in the diluted strength, so that the poison would penetrate to the roots instead of merely burning down the tops. Three hundred circular letters on the control of noxious weeds were sent out, together with the same number of printed instructions. Practically none of the Canada thistle in the county was allowed to go to seed. The results of this work can be determined only by continual observation over a period of years. The general results for the first year were very satisfactory. - L. E. Tillatson, jr., County Agent, Salmon, Lemhi County.

Indiana

Poison weed survey.- Considerable interest has been aroused as a result of a poison weed survey made at the request of farmers in Clinton County who have been losing livestock. On two farms where sheep and cattle have died from trembles, white snakeroot was found by Albert A. Hansen of Purdue University. On another farm where three sows have died in a mysterious manner, water hemlock was found in large quantities. Exhibits of both plants were displayed in a prominent window in Frankfort and an article of explanation was published in the papers. As a result, several farmers have learned that this is the source of some of their trouble. Two samples of white snakeroot and three of water hemlock have been brought in for identification and confirmation by farmers who saw the exhibits in the store window. These plants were exhibited in the farm bureau tent at the county fair.

Garlic-eradication campaign.- The garlic-eradication work in Dubois County was started by the calling of a joint meeting of farmers, grain-dealers and cream-buyers. Preliminary conferences were held with the grain-dealers to learn their attitude. Without exception, they acknowledged the seriousness of the garlic situation and agreed to cooperate in creating a sentiment for its eradication. About 70 persons were present at the joint meeting. Most of them were farmers, who showed a keen interest in the question. Several signified their intention of starting the eradication work on their own farms. Township meetings were held in order to reach those not present at the county meeting. Pike County has gone on record with the other counties of southern Indiana for a garlic campaign. From the reports received from farmers, it was found that there were 12,000 acres of garlic-infested land in Pike County. - T. R. Johnston, Purdue University, Lafayette.

Deaths from poison snakeroot.- The excessive dry hot weather during late summer caused livestock of all kinds to spend as much time as possible in woods. Pastures became poor and cattle ate almost anything green they could find. Several deaths throughout the county resulted and upon investigation a great deal of the poison snakeroot was found in wooded pastures. Most of the heavy timbers in the county were infested. When this fact became known many farmers requested pasture-roqueing demonstrations to determine whether the weed existed on their lands. Samples were gathered, potted, and placed on exhibition in store windows throughout the town along with written information explaining how death results, and describing the symptoms of the "milk sick" disease formerly so common in this county. Several woods were infested so badly that they never will be safe for pasture until cleared. Newspapers took up the work and spread information so extensively that everybody now knows the weed and the effects of the use of infected milk. - W. R. Zechiel, County Agent, Logansport, Case County.

Clean-culture method against garlic.- Realizing the seriousness of the situation in this part of the State, Albert A. Hensen, of the Purdue University extension department has spent considerable time here this summer in an effort to keep the garlic from spreading still farther north. The garlic-eradication campaign was started in this county with a meeting in Huntingburg of all the farmers who were interested. The meeting was addressed by representative grain-buyers and cream-buyers who discussed the nature of the damage done. Mr. Hansen then explained in detail the clean-culture method of getting rid of garlic and several farmers present agreed to try it. Later on community meetings were held in the garlic-infested areas and the method explained again. All the meetings were well attended and much interest was shown. A number of farmers in the county are giving the method a trial and it is hoped that the results will influence others. - James L. Morrow, County Agent, Jasper, Dubois County.

Iowa

Survey of Canada thistle.- During the latter part of 1921 and the early part of 1922 a preliminary survey of Canada thistle was made to determine to what extent it had established itself in Iowa. In some cases reports were received from county agents and in others from institutes and meetings. Reports of the number of acres per county, infested with Canada thistle ranged from 150 acres, in the least-affected county, to 10,000 acres. Fifteen counties were visited and the weed was found in all. It can be found in practically every county in patches from a few square feet up to 3 or 4 acres in size. In one county, fields as large as 30 acres were entirely covered. In order to combat Canada thistle, demonstrations were planned for its eradication. Counties were urged to make the campaign county-wide, but this did not seem feasible for the first year. Most of the counties in which the work was done plan to conduct a county-wide campaign next year. The extension department reached 13 counties and established 45 demonstration plots which are to be inspected again next year. - Plant Pathology Specialist.

Publicity regarding the weed evil. - Noxious weeds are on the same plane as tuberculosis as a destructive enemy to the farms of this county. Realizing this fact, we started a campaign last summer against weeds in general, and Canada thistle in particular, which we hope to continue on a much more intensive scale next year. Our aim was to bring about recognition of the seriousness of the pest, so that we should be able to start in earnest next summer. R. H. Porter, extension specialist, was in the county for a series of four demonstrations on the proper methods for killing Canada thistle. He also gave a general talk on weeds. Although these demonstrations came in the middle of harvest time, 117 farmers took time to attend. Interest was keen at every one of the demonstrations, and we feel certain that our campaign next year will be a success. Our general plan is to hold a demonstration in every township, and in addition to secure the cooperation of every board of trustees in enforcement of the weed-control law. We plan also to make a strong effort to educate the farmers in regard to the weed law. This is one of the most important factors in preventing bad weeds from getting a start. We shall also cooperate with the county superintendent of schools, so that every child attending our rural schools will be awakened to the importance of the weed evil. - W. T. Maakestad, County Agent, Algona, Kossuth County.

Methods of destroying Canada thistle.- Farmers in all parts of the county are very much interested in the eradication of the Canada thistle. Consequently they are anxious for the farm bureau to take an active part in the work. Demonstrations and discussions of control methods were given in each township in the county last year. Much interest was developed and several farmers began to combat the Canada thistle by one of the methods recommended. The work this year has been of a follow-up nature including the teaching of methods of control to a much larger number of farmers. We were able to point to definite demonstrations and give the results obtained there. A large number of inquiries as to how to eradicate the Canada thistle were received throughout the growing season. When the subject came up in any township or demonstrational meeting it always gained preference over

any other, even those such as ship subsidies, railroad rates or control of hog cholera.

We have found three quite practical methods of destroying the Canada thistle:

1. Plow the land in late spring and seed to some smother crop such as sorghum, sudan grass or millet. After the crop is removed in the fall, keep the land cultivated so that the thistle does not grow. Plant the next season to a crop such as corn that must be cultivated.
2. Plow the land in early fall, after a crop such as oats has been removed, deep enough to get beneath the underground horizontal root system. Rake and harrow out all thistle plants, including the roots, and destroy them. Keep the land cultivated until freezing weather so that the remaining plants can not grow, and remove all parts of plants that become visible. The next year this land should be planted to some cultivated crop.
3. Plow the land in early spring and keep it cultivated throughout the growing season so that the thistle cannot grow. Then plant to a cultivated crop the following year. - Lester Shepard, County Agent, Rock Rapids, Lyon County.

Maine

Control of kale or mustard.- For the past 10 years successful demonstrations have been conducted in spraying grain for the control of kale or mustard, sometimes known as wild turnip and wild radish. The material used at first was wholly sulphate of iron, a by-product of the steel manufacture. Later experiment showed that a large percentage of the plants could be killed by the use of sulphate of copper, commonly called blue vitriol. In the past two or three years most of the spraying has been done with the latter, as the cost of application per acre was less. The things to be considered for effective spraying are (1) the method of applying, (2) the strength of the solution, and (3) the time of application.

Equipment for spraying.- For the best results a six- or seven-nozzle boom is needed with nozzles not over 18 inches apart and as near the ground as will cover. Fine disks in the nozzles are the most important feature, since a fine spray is essential. Any pressure sprayer, horse- or hand-pump may be used, but for the best results a pressure of 80 to 100 per square inch should be maintained. The strength of the solution should be 90 to 100 sulphate of iron or 15 to 20 sulphate of copper thoroughly dissolved in 50 gallons of water. This, with fine disks in the seven nozzles, should cover approximately one acre of land.

Time of application.- Spraying is best done when the plant is young, with from three to five leaves, but it is profitable at any time before the plants come to full blossom. If the plants are sprayed when small, a second spraying should be made 7 to 10 days later to destroy the plants that had not yet appeared at the first application. As many as 95 per cent of the plants have been killed where this practice has been followed. The action of sulphate of iron is quicker, more advantageous in showery weather, and in general more satisfactory than that of copper. However, under favorable conditions and with the above precautions taken, copper sulphate or blue vitriol will kill kale and mustard, and considering present prices, will do it more economically. - Charles C. Larrabee, County Agent, Dover, Piscataquis County.

Maryland

Garlic eradication.- Due to the efforts of the Extension Service the farmers of Kent County are beginning to realize that the garlic problem in wheat is to eradicate the garlic and not merely to change the name of garlicky wheat. The county agent has discussed garlic eradication with nearly 50 farmers this year, has started nine demonstrations in garlic eradication, and has planned meetings on the subject for the coming winter. He has urged many farmers to have their wheat cleaned by the machine at Kennedyville, which is one of the best in the State. Over 15,000 bushels of seed wheat were cleaned by this machine for Kent County farmers this fall. - H. B. Derrick, County Agent, Chestertown, Kent County.

Minnesota

Use of alfalfa for control of Canada thistle.- Canada thistle is the worst pest in the county. It is scattered extensively over the entire county. During the summer months, hardly a day went by without a call at the office with reference to methods of control of this weed. Where farmers have a small patch of Canada thistle we have recommended the use of alfalfa. We have carried on one demonstration in the county the past two years, which shows conclusively that a good stand of alfalfa eventually will eradicate the weed. The ground was worked thoroughly and the seed sown in early summer. During the second season there were a few thistles in the patch. This year it was examined by the agent and several others, and not a thistle could be found in the entire field. A dozen or more farmers are planning to use alfalfa next year in places where there are a great many thistles. One farmer is going to try it on 40 acres. - M. E. Teeter, County Agent, Luverne, Rock County.

North Dakota

Campaign against sow thistle.- About the first of April publicity regarding the sow thistle was begun, describing the plant, its nature and growing habits, and the general infestation over the county. This was followed by two circular letters in June and a third letter about the first of July, scheduling a meeting in nearly every township. The first meeting held was at Tiffany with J. W. Haw in charge. Identification of various weeds was made by Mr. Haw, followed by a discussion of control and eradication methods. The farmers were made acquainted with the seriousness of the pest. Sixteen meetings urging action against the weed were held throughout the county. The commissioners were interviewed regarding the appointment of weed commissioners.

Results: - The results of the campaign were as follows:

1. Three weed commissioners were appointed.
2. Sixteen meetings were held with a total attendance of 427 persons, some of which knew the weed before.
3. Eleven committees were appointed to assist in rounding up complaints of neglected patches.
4. Seven hundred and eighty-three patches were located and mapped with possibly 95 per cent cut once.
Complete figures are not available as all have not been gathered from committeemen. - A. C. Peterson,
County Agent, New Rockford, Eddy County.

Work of weed commissioners in sow thistle control.- Sow thistle is now found in almost all of the farms in the county and is spreading so rapidly that it endangers the agricultural industry. For this reason the Nelson County commissioners found it advisable and necessary to appoint competent persons as commissioners of noxious weeds.

Due to the efforts of these weed commissioners many farmers that have not been doing it in the past, cut the sow thistle this year and accomplished a great deal of good. At the same time, some communities are not doing good work at all but are letting the sow thistle ripen and the wind carry it broadcast. Thus new patches will be started next year. It was evident that the district assigned to a weed commissioner was too large, even though some of them appointed two or three deputies. There ought to be a smaller district for each weed commissioner, in order that he may keep the work well in hand. Some of the weed commissioners did excellent work and others were not so successful. I believe that the control of the sow thistle in the future ought to be made a compulsory township enterprise. The four overseers of highways in each township ought to be the legally-appointed weed commissioners. - T. T. Kristianson, County Agent, Lakota, Nelson County.

Township organization against sow thistle.- This is the first year that there has been a strong campaign to get rid of the sow thistle. A general meeting was held at Cavalier early in the spring and practically all of those present voted that the county commissioners appoint weed commissioners and enforce the weed law. Therefore weed commissioners were appointed. My work was to get the townships organized to fight the weed. A meeting was held in every township in the county. Of the 24 townships, 22 were organized. From 3 to 12 farmers in each township were appointed to assist the weed commissioners in reporting badly infested fields so as to cut down the worst of the work. The farmers were asked to sign a pledge in order to find out the sentiment regarding weed-law enforcement. A total of 626 farmers attended these meetings, which were held in the evening on account of the rush of spring work. One hundred and ninety-two pledges were signed. These were from more than three-fourths of the landowners and tenants present at the meetings. The public, realizing that something had to be done to control the weed, stood almost solidly behind the movement. No crop was condemned and destroyed if it paid to harvest it, but if it contained much thistle the owner was requested to put the land into pasture or into a crop that would permit thorough cultivation. Not many fields were cut this year by the weed commissioners, all the farmers being given a chance to clean up and harvest their crops. However, many farms will be condemned for next year. They will have to be summer-fallowed or put into pasture or into a cultivated crop. About 8,000 acres were cut voluntarily this year because of the enforcement of the weed law. This is many times more than ever were cut before and it looks encouraging from the standpoint of weed control. - E. G. Parizek, County Agent, Cavalier, Pembina County.

Sow thistle control. - It was decided that something had to be done to check the spread of sow thistle this year, so a meeting was held in Corrine Township. The county agent formulated a petition to have a weed commissioner appointed for this district. It was circulated by leaders in various parts of the third commissioner district. The agent presented the petitions to the county board of commissioners which appointed A. A. Hoffman of Courtney as weed commissioner for the third district. Soon afterward Mr. Hoffman became ill and appointed two deputies to act for him. These men assisted the county agent in inspecting the townships infested with sow thistle and in calling the farmers' attention to the menace of the weed. Almost all of the patches found were cut promptly and measures were taken to prevent their spread. Next spring an effort will be made to follow up this work. The agent identified sow thistle for ten farmers and kept samples of it at the county fair and in his office, that farmers might learn to know it and watch for it.

Quack-grass-killing demonstration.- A quack-grass-killing demonstration was undertaken by J. Harry Wilson of Bloom Township. The hay was cut while in blossom and the field was shallow-plowed. The intention was to keep the field harrowed and disked in the fall, and to plow deep the following spring and put the field into a cultivated crop. Samples of quack grass, slender wheat grass and western wheat grass were kept in the office, that farmers coming in might learn to distinguish the three quite similar grasses. Six samples of these have been brought into the office for identification during the campaign. - R. S. Goodhue, County Agent, Jamestown, Stutsman County.

Campaign against sow thistle.- The county-wide attention to weed control was centered mainly on the perennial sow thistle. A vigorous campaign was carried on against this weed, continuing the work begun a year ago. The board of county commissioners again appointed weed commissioners in accordance with the State law. These weed commissioners travelled over their respective districts and superintended the destruction of all sow thistle coming to their attention. In a few instances it was necessary to have the work done by hired assistants and the cost charged against the land and collected in taxes. The extension agent developed the general reporting system used by the weed commissioners and arranged for the necessary printing, publicity, report blanks, and other items. Reports were made to the agent and records were kept at his office. The results of the sow thistle campaign are gratifying in some respects, yet unsatisfactory in others. The work of the weed commissioners and the general effect of the campaign have resulted in a greater and more widespread interest in the destruction of this weed than would have been the case otherwise. Many farmers were induced thereby to look after the control of the sow thistle on their land. It is a positive fact that as a result of the work of the weed commissioners a great many patches of sow thistle in every part of the county were prevented from going to seed. Thus inestimable good was accomplished.

Drawbacks to successful control.- From another angle the sow thistle campaign was not so satisfactory as might have been expected. Though a great deal of effective work was done the weed has a greater hold in the county than it had a year ago. It is like a pestilence that is being successfully combatted in a measure, but the ravages of which are too great to be overcome by the efforts of physicians. The weed law and the system of weed commissioners under which the county has been operating are by no means entirely satisfactory, due to the following causes: (1) The assignment of only one weed commissioner to each commissioner district is not enough. It is a physical impossibility for him to cover the territory satisfactorily. (2) Too much red tape is involved in compulsory cutting of the weed. Ten days' notice is too long, since many patches of the weed are not discovered until they are in full bloom. When the weeds are in blossom there is no time to lose, and the weed commissioner should have authority to have the weeds destroyed at once, without notice. (3) The scarcity of the right type of man to serve as weed commissioner is also a serious problem. The experience of this county shows that there are very few men locally available who will prosecute their duties as weed

commissioner with sufficient zeal and authority to make the work effective. (4) The carelessness and indifference toward small patches of the weed on the part of a great many farmers, both landowners and renters, is another serious handicap. The matter of a few weeds appears to them insignificant when other farm work is pressing. In most instances careful management of time and labor would provide for the destruction of the small weed patches without serious interference with or loss of time in other work. - A. H. Neuman, Cando, Tower County.

Survey of sow thistle.- The county agent held three township sow thistle meetings in the eastern part of the county, which is infested with perennial sow thistle. As a result of these meetings, farmers passed resolutions asking the county board to appoint weed commissioners. The weed commissioners, assisted by the county agent, located 55 patches of sow thistle and caused their destruction. The results of the meetings and of the weed commissioners' work have made practically every farmer in the eastern half of the county acquainted with sow thistle. A survey of this part of the county shows that about 95 per cent of the farms are infested. Fully 80 per cent of the owners of these farms insisted during the summer that they did not have the plant on their farms but later they changed their views. The county agent published an article in the county papers stating that there must exist in the vicinity of Cathay a large patch of sow thistle which had been infesting that region for several years. A few days later a farmer telephoned that the patch had been found, covering about 15 acres. With the assistance of the county agent immediate action was brought about and the plants were cut down, dried and burned. - Edwin W. Vancoura, County Agent, Passenden, Wells County.

Oregon

Seriousness of Canada thistle infestation.- The Canada thistle is the most serious weed pest in the county, having flourished here for more than 20 years. There is hardly a farm on which thistle is not found. In some communities this pest has overgrown large areas of our best agricultural lands in the river bottom, making them not only useless for farming but also breeding spots from which comes infestation to the entire surrounding region. The area of infestation has increased each year, causing the pest to become a serious menace. According to the statutes, the county court is charged with the duty of enforcing the noxious-weed law. It was the practice of the court to appoint from four to eight men as thistle inspectors, whose duty it was to serve a printed notice on each landowner requesting his compliance with the weed law. This system was expensive, costing the county \$736.84 in 1921 for the printing and distribution of the notices and the cutting of a few thistles. It was also ineffective since the landowners regarded it as useless, resented the serving of the notice, and often promised the inspector physical harm should he return in 10 days to see if the farmer had cut down his thistles and complied with the law as stated in the notice. The inspectors therefore had no strong desire to return, and besides, the shortage of county money for this purpose made a second trip impossible. Moreover, the county was not organized according to districts. Each inspector went where he

chose. Often they followed on each other's trails while some parts of the county were not visited at all. The result was that the farmers who regarded the thistle as a serious pest worked as energetically as before to control it on their own farms. On the other hand there were in each community a number of absentee landowners and others who were careless and neglectful. From their lands the ripened seed blew into the farms of those who were using control methods, making their work much more difficult. Because of this loose and inefficient method of control the thistle became a more serious menace from year to year. Therefore, the agent believed that since this was an agricultural problem, he had a right to offer his services to the county court in working out more effective control methods.

Organization of control project.- In organizing his program of work the agent urged upon each community the importance of a thistle control project. He also emphasized the necessity of the farmers' taking the initiative in enforcing the noxious-weed law. He declared that they were the law and that if they wanted relief they could get it for themselves. If they did not want relief then no one outside cared whether they grew thistles or not, nor would anyone be interested in enforcing the law among them, it being their own duty aggressively to enforce control measures. The result was that 34 communities which had organized programs adopted the project. Two in which the thistles were the most serious refused, while 4 others were not organized. However, the agent succeeded in getting work done in 38 communities including the 2 that had refused. In each community from one to three project leaders were selected. These were called to a county-wide meeting in Albany on April 18 to devise methods of campaign. The members of the county court, the district attorney and the county sheriff were requested to attend also. The procedure at this meeting consisted of a statement by the agent concerning the purpose of the meeting, the election of a chairman, the reading of a paper by the district attorney on the interpretation of the present law, a statement by the sheriff on using diplomacy in enforcing measures, and a statement by the county judge of the necessity for taking aggressive steps. Then a definite plan of action was presented by the agent and adopted by the assembly.

Landowners' agreement.- The plan consisted in having each project leader circulate a landowners' agreement among the farmers of his community for the purpose of ascertaining who would deal with his thistles according to law without having an expensive notice served on him. The purpose was to get as many as possible to agree to cooperate with the leader, who was to be appointed by the court as an inspector that he might make the most of an unpopular job. It was, in other words, a "separation of the sheep from the goats" so that the inspector later might center his attention on those who refused to cooperate. The circulation of this landowners' agreement had a wholesome educational effect. Early in the year it brought attention to the pest. There was a large number of farmers that thought it useless for themselves to comply with the law while so many others were deliberately careless. These also now signed the agreement thinking that if all would cooperate some good might be accomplished. This left unaffected by the agreement only a small unpopular minority. Publicity was given the results in each community by circular letters. The newspapers

printed copies of these together with the names. The county agent mailed an account of the results to each landowner, including those who failed or refused to sign. This made them the target of the community with the result that they often did better than others in cutting their thistles. With the circular letter the agent sent also an extract from the weed pest law and a copy of Farmers' Bulletin No. 1002, "The Canada Thistle and Methods of Eradication." Two thousand seven hundred of these bulletins were so distributed. A summary of the reports from 32 communities which reported, showed that 1,550 farmers controlling 205,868 acres signed the agreements mentioned above.

Recommendations for improvement of weed law.- On the recommendation of the agent, the county judge appointed all of the project leaders together with enough more to make 56 in all, as inspectors who would have the authority to visit any farm or land to ascertain the facts about the thistle. Near the close of the season the agent sent out questionnaires to these 56 inspectors. Only 39 replies were received. The agent then called another county-wide meeting of the inspectors together with members of the county court, the district attorney and the sheriff to hear a summarized report of this year's activities by the agent, and to hear the inspectors give accounts of their own experience and make recommendations for the improvement of the noxious-weed law. The recommendations made for the improvement of the law were as follows:

1. No notice should be required.
2. Threshermen should not be allowed to thresh Canada thistle.
3. An inspector should be placed in each school district.
4. The district inspectors should report violations of the law to the sheriff who should have the power to arrest and fine without any costly court procedure.

The agent, the district attorney and one farmer were appointed to draft amendments to the present law. This committee has already acted and the bill is ready to be acted upon by the legislature. While the inspectors have not yet turned in to the county court all bills for service rendered, it is estimated that the total cost to the county this year will be not more than \$150. This amount compared to the \$736.84 spent the previous year speaks well for the industry and loyalty of the inspectors.

Conclusions.- In conclusion, we may say that while there were a few who agreed to cooperate in cutting thistles who still neglected the work, this was the first year in the history of the Canada thistle in Linn County that it did not increase its already extensive area. There are hundreds of small patches in the cultivated area that have been eradicated by weekly cultivation, which cut off the plant before it even came through the ground. Also the enthusiasm of the farmers to tackle the Canada thistle next year augurs well. Whatever changes may be made in the law for 1923, there will be in all probability, one thistle inspector for each of the 125 school districts in the county, and it is the intention now to make the thistle fairly scarce before the close of another year. - A. C. Heyman, County Agent, Albany, Linn County.

South Dakota

Use of weed herbarium in control work.- Various weeds were identified throughout the summer and proper methods of eradication were taught. A weed herbarium is in the process of completion in this county. This herbarium is made from an old tailor-made cloth sample book. The names of all weeds are inserted with a little history if possible. This has been used at county picnics and a few local meetings especially to show the Canada and sow thistles. The county is quite seriously infested with the Canada thistle. The sow thistle has not made its appearance, but I think that the people should be educated to know it before it appears. The book has aroused much interest and farmers often bring in weeds for identification. Three farmers are trying the deep-plowing methods of eradicating the Canada thistle. One plowed early in August and seems to have had good results. Another plowed about the 7th of June with apparently excellent results. Another farmer plowed about the 14th of June but it rained and he had little success. However, he has disked and top-worked the soil and hopes to destroy the thistle before next year. We plan to use a heavy cover crop on some of the patches next year. We hope to have sufficient success to warrant making these demonstrations large meetings. - Henry O. Putnam, County Agent, Elk Point, Union County.